quency of the second harmonic noise is above 7000 c.p.s. using the formula:

$$B \geq \frac{7000}{3N}$$

where 3 is the harmonic noise index, the number of vanes V in the stators being selected so that the least number in absolute value of m given by the equation:

$$m=B+kV$$

also satisfies the equation:

$$m \geq BM_B/M^*_m$$

thereby causing the fundamental frequency noise to decay, where k is an index that ranges independently over all positive and negative integers, M_B is rotor tip Mach number, and M^*_m is the critical Mach number of the m-lobe pattern, said first stator being positioned with respect to said second stator to cause the noise creating spinning modes so created thereby to be equal intensity and opposite phase to cancel the first noise harmonic.

37. An axial flow compressor within a fluid flow defining duct and having a pair of rows of stator vanes and a row of rotor blades positioned within the duct therebetween and with each of said rows of vanes having the same number of vanes, means to support said row of rotor blades and said rows of stator vanes such that said blades rotate with respect to said vanes thereby establishing a first fundamental rotating noise creating pressure field due to the interaction of the pressure fields of the wakes of the first row of stator vanes and the pressure fields at the inlet end of rotor blades and a second fundamental rotating noise creating pressure field caused by the interaction of the pressure fields of the wakes of the row of rotor blades and the second row of stator vanes and also establishing first harmonic rotating noise creating pressure fields comparable to the fundamental fields but having a different rate of rotation, means for angularly positioning said second row of vanes such that the first fundamental rotating noise creating pressure field is substantially 180° out of phase with the second fundamental rotating noise creating pressure field, and means for adjusting the position of said second row of vanes in a direction along the pressure ridges of the fundamental noise creating pressure fields until the harmonic noise creating pressure fields are substantially 180° out of phase, thereby balancing the noise creating harmonic fields while maintaining a balance between the noise creating fundamental fields.

38. An axial flow compressor within a fluid flow defining duct and having a pair of spaced rows of stator vanes and a row of rotor blades positioned therebetween within the duct, each of said rows of vanes having the same number of vanes, means to support said rows of vanes stationary in spaced relation and to support said row of blades therebetween for rotation with respect thereto to establish two identical pairs of fundamental rotating noise creating pressure fields having different lobe numbers produced by the interaction between the wakes of the first row of stator vanes and the row of rotor blades and the interaction between the wakes of the rotor blades and the second row of stator vanes, means for positioning said second row of vanes which respect to said first row of vanes so that one pair of said fundamental rotating noise creating pressure fields are substatnially 180° out of phase, and means to adjust the position of said second row of vanes further along the high pressure ridges of the first pair of noise creating pressure fields, thereby maintaining the relationship between the first pair of fundamental noise creating pressure fields, until the second pair of fundamental rotating noise creating pressure fields are substantially 180° out of phase.

39. An axial flow compressor within a fluid flow defining duct and having first and second rows of stator vanes with equal number of vanes in both rows and a row of rotor blades therebetween within the duct, in which a first rotating noise creating pressure field is produced by the interaction of the wakes of the first stator vanes and the first rotor, and another noise creating pressure field is produced by the interaction of the wakes of the rotor blades and the second stator vanes, and in which the rotating noise creating pressure fields, having the same number of lobes, are rotating at the same r.p.m. and in the same direction, the vanes of the first row and the vanes of the second row being so positioned relative to each other that the first noise creating pressure field is out of phase with the second noise creating pressure field and the two fields are substantially cancelled out.

40. The apparatus as in claim 39 in which the axial spacing of the rotor blades to the stator vanes is adjusted so that the magnitudes of the two fields are substantially equal.

41. The apparatus as in claim 39 in which a second row of rotor stage blades is located downstream of the second stator vanes and a third row of staator vanes having the same number of vanes as the first and second stator rows, is located downstream of the second row of rotor blades, and in which the angular relation of the vanes in the third row of stator vanes is such with respect to the vanes in the second row as to have the rotating noise creating pressure field produced by the interaction between the second rotor blades and the third stator row out of phase with the rotating noise creating pressure field produced by the interaction between the second stator row and second rotor row.

42. The apparatus as in claim 41 in which the first and second blade rows have an equal number of blades and in which the angular relation of the blades of the first rotor row is such, with respect to the blades of the second rotor row, that the first harmonic noise of the resultant of the interactions on opposite sides of the first rotor row are out of phase with the first harmonic noise of the resultant of the interactions on opposite sides of the second rotor row.

43. A marine propeller within a fluid flow defining duct and including a rotor and a first and a second stator, means to support said rotor for rotation between said two stators to establish stator-rotor interaction noise creating spinning modes between said first stator and said rotor and between said rotor and said second stator, means to cause said rotor to rotate so that said spinning modes are established with the highest troublesome harmonic noise equal to n and so that rotor blade tip Mach number M_B is ⅓ or less, in particular greater than

$$\frac{1}{2n+1}$$

and equal to or less than

$$\frac{1}{2n-1}$$

and so that the number of blades in said rotor B and number of vanes in said stators V is selected according to the formula:

$$B(1+M_B) \leq V \leq \frac{n}{n-1} B(1-M_B)$$

44. In an axial flow compressor within a fluid flow confining duct, a stator positioned between two rotors in said duct, said rotors having an equal number of blades positioned about the periphery thereof, said stator having a plurality of vanes different in number from the number of said blades in each of said rotors and positioned about the periphery thereof and coacting with said rotor blades to form two similar noise creating spinning mode patterns, means to position the blades of each rotor relative to one another and said stator whereby said noise creating spinning mode patterns are of substantially equal intensity and out of phase so as to cancel the noise.